

[4910-13-U]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 98-ANE-27-AD]

RIN 2120-AA64

Airworthiness Directives; Textron Lycoming and Teledyne Continental Motors

Reciprocating Engines

AGENCY: Federal Aviation Administration, DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: This document proposes the adoption of a new airworthiness directive (AD) that is applicable to certain Textron Lycoming and Teledyne Continental Motors reciprocating engines that had crankshafts repaired by Nelson Balancing Service, Repair Station Certificate No. NB7R820J, Bedford, Massachusetts. This proposal would require removal from service of affected crankshafts, or a visual inspection, magnetic particle inspection, and dimensional check of the crankshaft journals, and, if necessary, rework or removal from service of affected crankshafts and replacement with serviceable parts. This proposal is prompted by reports of crankshafts exhibiting heat check cracking of the nitrided bearing surfaces which led to crankshaft cracking and subsequent failure. The actions specified by the proposed AD are intended to prevent crankshaft failure due to cracking, which could result in an inflight engine failure and possible forced landing.

DATES: Comments must be received by [Insert date 30 days after date of publication in the **Federal Register**].

ADDRESSES: Submit comments in triplicate to the Federal Aviation Administration (FAA), New England Region, Office of the Regional Counsel, Attention: Rules Docket No. 98-ANE-27-AD, 12 New England Executive Park, Burlington, MA 01803-5299.

Comments may also be sent via the Internet using the following address: "9-ad-engineprop@faa.dot.gov". Comments sent via the Internet must contain the docket number in the subject line. Comments may be inspected at this location between 8:00 a.m. and 4:30 p.m., Monday through Friday, except Federal holidays.

FOR FURTHER INFORMATION CONTACT: Rocco Viselli, Aerospace Engineer (assigned to Textron Lycoming), New York Aircraft Certification Office, FAA, Engine and Propeller Directorate, 10 Fifth St., 3rd Floor, Valley Stream, NY 11581-1200; telephone (516) 256-7531, fax (516) 568-2716; or Jerry Robinette, Aerospace Engineer (assigned to Teledyne Continental Motors), Atlanta Aircraft Certification Office, FAA, Small Airplane Directorate, 1895 Phoenix Boulevard, One Crown Center, Suite 450, Atlanta, GA 30349; telephone (770) 703-6096, fax (770) 703-6097.

SUPPLEMENTARY INFORMATION:

Comments Invited

Interested persons are invited to participate in the making of the proposed rule by submitting such written data, views, or arguments as they may desire. Communications should identify the Rules Docket number and be submitted in triplicate to the address specified above. All communications received on or before the closing date for comments, specified above, will be considered before taking action on the proposed rule. The proposals contained in this notice may be changed in light of the comments received.

Comments are specifically invited on the overall regulatory, economic, environmental, and energy aspects of the proposed rule. All comments submitted will be available, both before and after the closing date for comments, in the Rules Docket for examination by interested persons. A report summarizing each FAA-public contact concerned with the substance of this proposal will be filed in the Rules Docket.

Commenters wishing the FAA to acknowledge receipt of their comments submitted in response to this notice must submit a self-addressed, stamped postcard on which the following statement is made: "Comments to Docket Number 98-ANE-27-AD." The postcard will be date stamped and returned to the commenter.

Availability of NPRMs

Any person may obtain a copy of this NPRM by submitting a request to the FAA, New England Region, Office of the Regional Counsel, Attention: Rules Docket No. 98-ANE-27-AD, 12 New England Executive Park, Burlington, MA 01803-5299.

Discussion

reports of crankshafts installed in certain Textron Lycoming and Teledyne Continental Motors (TCM) reciprocating engines cracking after repair by Nelson Balancing Service, Repair Stations Certificate No. NB7R820J, Bedford, Massachusetts. The investigation revealed that the crankshafts exhibit heat check cracking of the nitrided bearing surfaces. The cracking of the nitride surface is believed to be due to improper grinding procedures. Grinding occurred as part of the engine overhaul process. Improper grinding can result in overheating the crankshaft, which, in turn, results in cracking of the nitride surface. If the crankshaft is returned to service with the nitride surface cracked, the crankshaft will fail. The cracks occur in the forward and/or aft fillet of the main bearing journals and/or crankpin journals. The time to failure depends on the severity of the cracking but the crankshaft will not complete the overhaul cycle. There have been 28 cases of crankshafts installed on certain Textron Lycoming reciprocating engines that have been classified as cracked, 3 broken, and 2 later rejected by Nelson Balancing Service; and 3 reports of crankshaft failure and 7 cases of crankshafts being rejected when reinspected, due to heat check cracking, on certain TCM engines. This condition, if not corrected, could result in crankshaft failure due to cracking, which could result in an inflight engine failure and possible forced landing.

Since an unsafe condition has been identified that is likely to exist or develop on other products of this same type design, the proposed AD would require removal from service of affected crankshafts, or a visual inspection, magnetic particle inspection, and dimensional check of the crankshaft journals, and, if necessary, rework or removal from service of affected crankshafts and replacement with serviceable parts.

There are approximately 250,000 engines of the designs listed in the applicability section of this AD in the worldwide fleet. The FAA estimates that 200,000 of those engines are installed on aircraft of U. S. registry. Of these it is estimated that 30% or 60,000 engines will have had an overhaul in the time frame of interest; however, only 291 would be required to take compliance action. Of this 60,000 it is estimated that 10,000 will require removal of the propeller spinner to determine applicability of the AD. The cost associated with the spinner removal/replacement is estimated to be \$60 per work hour average labor rate times one hour. It will take approximately 90 work

hours per engine to accomplish the proposed action and the average labor rate is \$60 per work hour. Required parts would cost \$115 per engine for gaskets, seals, etc. In addition, it is estimated that half of the 291 affected engines can be reworked at a cost of \$1,800 per engine and that the other half of the 291 affected engines will be rejected, plus purchasing another crankshaft which will cost \$4,000 per engine. Based on these figures, the total cost impact of the proposed AD on U. S. operators is estimated to be \$3,048,765.

The regulations proposed herein would not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that this proposal would not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

For the reasons discussed above, I certify that this proposed regulation (1) is not a "significant regulatory action" under Executive Order 12866; (2) is not a "significant rule" under the DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979); and (3) if promulgated, will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act. A copy of the draft regulatory evaluation prepared for this action is contained in the Rules Docket. A copy of it may be obtained by contacting the Rules Docket at the location provided under the caption "ADDRESSES."

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Safety.

The Proposed Amendment

Accordingly, pursuant to the authority delegated to me by the Administrator, the Federal Aviation Administration proposes to amend part 39 of the Federal Aviation Regulations (14 CFR part 39) as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§39.13 [Amended]

2. Section 39.13 is amended by adding the following new airworthiness directive:

Textron Lycoming and Teledyne Continental Motors: Docket No. 98-ANE-27-AD.

Applicability: Textron Lycoming (LYC) O-235, O-235-C1, O-235-C2C, O-235-L2C, O-235-N2C, O-290, O-290-D2, O-320, O-320-A, O-320-A1A, O-320-A2B, O-320-B2B, O-320-B2C, O-320-D2J, O-320-D3G, O-320-E2A, O-320-E2D, O-320-E2G, O-320-E3D, O-320-H2AD, O-360, O-360-A1A, O-360-A1D, O-360-A3A, O-360-A4A, O-360-A4K, O-360-B1B, IO-360-F1A6, AEIO-320-E1B, HIO-360-C1A, IO-320, IO-320-B1A, IO-360, IO-360-A1A, IO-360-A1B6, IO-360-B1E, IO-360-C, IO-360-CIC, IO-360-C1C6, IO-360-C1D6, IO-360-D, O-540-A1B5, O-540-A1D5, O-540-R2AD, IO-540, IO-540-C4B5, IO-540-S1A5, TIO-540-A2, LIO-320-C1A, LIO-360-C1E6, and O-720 reciprocating engines; and Teledyne Continental Motors (TCM) A-65, A65-3, A65-8, A75, A75-8, C75-12, C85, C85-8, C85-12, C90-8FJ, C90-12, O-200, O-200-A, O-300, O-300-D, IO-360-C, E-185-4, E-225-8, O-470, O-470-K, O-470-L, O-470-R, O-470-11, IO-470, IO-470-N, IO-470-S, IO-520, IO-520-D, GTSIO-520, and TSIO-520-VB reciprocating engines, with installed crankshafts repaired by Nelson Balancing Service, Bedford, Massachusetts, Repair Station Certificate No. NB7R820J, between February 1, 1995, and December 31, 1997, inclusive, as listed (by work order (W/O)) in Table 1 of this AD.

Table 1

ENGINE	MODEL	W/O	DATE	ENGINE SER#
LYC	AEIO-320-E1B	1134	2/17/96	L-5653-55A
LYC	HIO-360-C1A	1155	2/7/96	L-12126-51A
LYC	IO-320	1141	1/17/96	
LYC	IO-320-B1A	1525	11/14/97	
LYC	IO-360	1314	12/17/96	
LYC	IO-360	IN6137	8/7/97	
LYC	IO-360-A1A	1230	6/10/96	L-474-51
LYC	IO-360-A1A	1289	10/23/96	L-4085-5174
LYC	IO-360-A1A	1415b	5/23/97	RL-3920-51A
LYC	IO-360-A1B6	1463	7/31/97	
LYC	IO-360-B1E	1312	12/12/96	L-4453-51A
LYC	IO-360-C	1146	1/23/96	R-51448-9-C
LYC	IO-360-C1C	1336	2/10/97	
LYC	IO-360-C1C	1518	12/9/97	
LYC	IO-360-C1C6	1530	11/25/97	
LYC	IO-360-C1C6	1537	12/9/97	L-19294-51A
LYC	IO-360-C1D6	1286	4/28/97	
LYC	IO-360-D	1540	12/2/97	
LYC	IO-360-F1A6	1176	3/7/96	L-27423-36A
LYC	IO-540	1014	2/8/95	
LYC	IO-540	1056	6/13/95	
LYC	IO-540	1302	12/5/96	
LYC	IO-540-C4B5	1313	12/17/96	L-19547-48

LYC	IO-540-S1A5	1513	10/27/97	L-19597-48A
LYC	IVO-435-G1A	1271		
LYC	LIO-320-C1A	1158	2/8/96	
LYC	LIO-360-C1E6	1280	10/7/96	
LYC	LIO-360-C1E6	1281	10/9/96	
LYC	O-235	1013	2/21/95	
LYC	O-235	1051	6/2/95	
LYC	O-235	1054	6/9/95	
LYC	O-235	1057	6/14/95	L-9041-15
LYC	O-235	1058	6/29/95	
LYC	O-235	1060	6/30/95	
LYC	O-235	1069	8/10/95	
LYC	O-235	1110	2/20/96	
LYC	O-235	1145	1/23/96	
LYC	O-235	1151	1/25/96	
LYC	O-235	1160	2/9/96	RL-24636-15
LYC	O-235	1305	12/5/96	L-22542-15
LYC	O-235	1329	2/11/97	
LYC	O-235	1332	2/11/97	
LYC	O-235	1481	9/2/97	
LYC	O-235-C1	1089	10/8/95	L-6475-15
LYC	O-235-C1	1188	4/2/96	L-7143-15
LYC	O-235-C1	1335	3/12/97	L-5569-15
LYC	O-235-C1	1367	3/24/97	
LYC	O-235-C2C	1019	2/24/95	L-12284-15
LYC	O-235-C2C	1040	5/8/95	
LYC	O-235-C2C	1105	12/1/95	L-12273-15
LYC	O-235-L2C	1030	4/6/95	L-14545-15

LYC	O-235-L2C	1036	4/24/95	
LYC	O-235-L2C	1037	4/24/95	L-23012-15
LYC	O-235-L2C	1050	6/2/95	L-15542-15
LYC	O-235-L2C	1062	7/5/95	L-18306-15
LYC	O-235-L2C	1067	8/8/95	
LYC	O-235-L2C	1070	8/10/95	L-16005-15
LYC	O-235-L2C	1095	11/14/95	RL-023227-15
LYC	O-235-L2C	1101	11/4/95	L-15300-15
LYC	O-235-L2C	1102	11/15/95	L-20183-15
LYC	O-235-L2C	1162	2/14/96	L-16114-15
LYC	O-235-L2C	1179	3/11/96	L-21215-15
LYC	O-235-L2C	1219	5/16/96	L-21215-15
LYC	O-235-L2C	1251	8/22/96	
LYC	O-235-L2C	1285	10/19/96	
LYC	O-235-L2C	1365	3/24/97	
LYC	O-235-L2C	1400	4/28/97	
LYC	O-235-L2C	1414	8/5/97	
LYC	O-235-L2C	1417	12/5/97	
LYC	O-235-L2C	1433	6/26/97	L-17074-15
LYC	O-235-L2C	1435	6/9/97	
LYC	O-235-L2C	1504	10/31/97	
LYC	O-235-L2C	1508	11/18/97	
LYC	O-235-L2C	1524	11/12/97	
LYC	O-235-L2C	1536	11/24/97	
LYC	O-235-L2C	2010	11/19/97	
LYC	O-235-N2C	1511	10/29/97	L-23857-15
LYC	O-290	1257	9/4/96	
LYC	O-290	1326	3/26/97	

LYC	O-290-D2	1082	9/26/95	L-6019-21
LYC	O-320	1018	2/22/95	
LYC	O-320	1024	3/17/95	
LYC	O-320	1038	5/3/95	L-39272-27A
LYC	O-320	1045	5/24/95	
LYC	O-320	1084	9/28/95	
LYC	O-320	1116	1/8/96	
LYC	O-320	1125	1/8/96	
LYC	O-320	1169	2/28/96	
LYC	O-320	1175	3/7/96	
LYC	O-320	1184	3/28/96	
LYC	O-320	1189	8/27/96	
LYC	O-320	1202	4/30/96	
LYC	O-320	1212	5/10/96	
LYC	O-320	1283	10/17/96	
LYC	O-320	1316	12/21/96	
LYC	O-320	1340	2/25/97	L-24367
LYC	O-320	1347	2/18/97	
LYC	O-320	1360	3/10/97	
LYC	O-320	1361	3/10/97	
LYC	O-320	1436	5/29/97	
LYC	O-320	1468	8/14/97	
LYC	O-320	1474	8/22/97	L-13130-39A
LYC	O-320	1477	9/13/97	
LYC	O-320	1477	9/13/97	
LYC	O-320	1507		
LYC	O-320	1519	11/21/97	
LYC	O-320	1546	12/7/97	

LYC	O-320	1171	3/1/96	
LYC	O-320-A	1192	4/13/96	
LYC	O-320-A	1194	4/13/96	
LYC	O-320-A	1196	4/13/96	
LYC	O-320-A1A	1244	8/13/96	L-5270-27
LYC	O-320-A2B	1081	9/22/95	
LYC	O-320-A2B	1461	9/9/97	L-12626-27
LYC	O-320-B2B	1452	7/10/97	L-2977-39
LYC	O-320-B2C	1315	12/17/96	
LYC	O-320-D2J	1172	3/4/96	L-13039-39A
LYC	O-320-D2J	1173	3/7/96	L-123412-39A
LYC	O-320-D2J	1253	9/4/96	
LYC	O-320-D2J	1534	11/25/97	
LYC	O-320-D2J	1539	12/3/97	
LYC	O-320-D3G	1077	9/17/95	
LYC	O-320-D3G	1114	1/8/96	L-10983-39A
LYC	O-320-D3G	1354	2/25/97	
LYC	O-320-D3G	1370	3/26/97	H45247
LYC	O-320-D3G	1544	12/3/97	
LYC	O-320-E2A	1103	11/10/95	L-26363-27A
LYC	O-320-E2A	1191	4/13/96	L-19377-27A
LYC	O-320-E2A	1317	12/21/96	L-15219-27A
LYC	O-320-E2A	1439	6/9/97	L-38003-55A
LYC	O-320-E2D	1068	8/10/95	L-35528-27A
LYC	O-320-E2D	1078	9/17/95	
LYC	O-320-E2D	1177	3/9/96	L-44732-27A
LYC	O-320-E2D	1181	3/14/96	
LYC	O-320-E2D	1241	8/9/96	L-42691-27A

LYC	O-320-E2D	1245	8/13/96	L-40483-27A
LYC	O-320-E2D	1260	9/9/96	L-15300-15
LYC	O-320-E2D	1343	2/17/97	
LYC	O-320-E2D	1346	3/2/97	L-44320-27A
LYC	O-320-E2D	1385	4/16/97	
LYC	O-320-E2D	1458	7/18/97	
LYC	O-320-E2D	1533	11/25/97	
LYC	O-320-E2D	1549	12/12/97	
LYC	O-320-E2G	1338	3/10/97	L-38264-27A
LYC	O-320-E3D	1034	4/18/95	L-29668-27A
LYC	O-320-E3D	1074	8/24/95	L-29495-27A
LYC	O-320-E3D	1431	6/9/97	L-33770-27A
LYC	O-320-E3D	1444	6/13/97	
LYC	O-320-E3D	1500	10/7/97	L-33841-27A
LYC	O-320-H2AD	1322	1/22/97	L-1530-78T
LYC	O-360	1025	3/17/95	
LYC	O-360	1157	2/7/96	
LYC	O-360	1199	4/18/96	
LYC	O-360	1362	3/10/97	
LYC	O-360	1386	4/17/97	
LYC	O-360	1394	5/6/97	
LYC	O-360	1528	11/19/97	
LYC	O-360-A1A	1170	2/28/96	L-20677-36A
LYC	O-360-A1A	1214	5/14/96	L-20190-36A
LYC	O-360-A1A	1239	8/5/96	
LYC	O-360-A1D	1411	5/5/97	
LYC	O-360-A3A	1531	11/25/97	
LYC	O-360-A4A	1270	9/27/96	L-14008-36A

LYC	O-360-A4A	1464	7/30/97	L-24796-36A
LYC	O-360-A4A	1486	9/6/97	
LYC	O-360-A4A	1529	11/25/97	
LYC	O-360-A4K	1166	2/22/96	L-26455-36A
LYC	O-360-B1B	1262	9/9/96	L-5261-51A
LYC	O-540-A1B5	1129	12/29/95	
LYC	O-540-A1B5	1132	1/9/96	L-1165-40
LYC	O-540-A1D5	1462	7/28/97	L-5661-40
LYC	O-720	1510	10/26/97	
LYC	TIO-540-A2	1064	7/13/95	
LYC	TIO-540-A2	1111	1/10/96	
LYC	TIO-540-R2AD	1106	11/27/95	L-5949-61A
TCM	A-65	1152	1/25/96	
TCM	A-65	1154	2/7/96	7187
TCM	A-65	1183	2/22/96	
TCM	A-65	1185	3/28/96	
TCM	A-65	1233	6/23/96	
TCM	A-65	1290	10/29/96	
TCM	A-65	1296	11/14/96	4933868
TCM	A-65	1299	11/19/96	
TCM	A-65	1325	3/26/97	
TCM	A-65	1326	3/26/97	
TCM	A-65	1376	4/29/97	
TCM	A-65	1438	6/17/97	5890178
TCM	A-65-3	1243	8/13/96	324993
TCM	A-65-8	1541	12/2/97	
TCM	A65-8	1276	10/5/96	5762568
TCM	A75	1156	2/7/96	5321868

TCM	A75	1255	9/3/96	
TCM	A75	1256	9/4/96	
TCM	A75-8	1275	10/5/96	5162868
TCM	C75-12F	1293	11/4/96	3316-6-12
TCM	C85	1088	10/4/95	
TCM	C85	1092	10/18/95	
TCM	C-85	1198	4/17/96	29652-7-8
TCM	C-85	1297	11/14/96	
TCM	C-85	1352	3/10/97	
TCM	C-85	1381	4/28/97	
TCM	C-85	1391	4/19/97	
TCM	C-85	1392	4/19/97	
TCM	C-85	1484	9/4/97	28487-6-12
TCM	C-85-8FJ	1139	1/17/96	29845-7-8
TCM	C-85-8FJ	1420	5/12/97	29465-7-8
TCM	C-85-12	1031	4/6/95	
TCM	C85-12	1182	3/18/96	21596-6-12
TCM	C-85-12	1217	5/15/96	
TCM	C85-12	1265	9/12/96	14657
TCM	C-85-12	1298	11/14/96	23610-6-12
TCM	C-90-8F	1471	9/6/97	42838-1-8
TCM	C-90-12	1279	10/7/96	44747-6-12
TCM	E-185-4	1124	1/16/96	25700D-1-9
TCM	E-225-8	1505	10/28/97	35477-D-9-8-P
TCM	GTSIO-520	1208	5/7/96	210114-70H
TCM	IO-360-C	1126	12/28/95	F-51439-9-C
TCM	IO-470	1028	3/23/95	87329-R
TCM	IO-470-N	1421	5/13/97	95271-1-N

TCM	IO-470-S	1331	3/11/97	102412-2-S-I
TCM	IO-520	1174	3/4/96	
TCM	IO-520-D	1167	2/22/96	
TCM	O-200	1033	4/18/95	
TCM	O-200	1043	5/12/95	
TCM	O-200	1049	6/2/95	
TCM	O-200	1076	9/11/95	214668-27A
TCM	O-200	1104	11/21/95	213830-71A
TCM	O-200	1131	1/5/96	
TCM	O-200	1142	1/18/96	265349-R
TCM	O-200	1147	1/23/96	
TCM	O-200	1190	4/13/96	
TCM	O-200	1193	4/13/96	
TCM	O-200	1195	4/13/96	
TCM	O-200	1197	4/17/96	
TCM	O-200	1213	5/13/96	
TCM	O-200	1261	9/9/96	
TCM	O-200	1303	12/5/96	
TCM	O-200	1321	2/7/97	28115
TCM	O-200	1324	2/6/97	
TCM	O-200	1344	3/2/97	
TCM	O-200	1393	5/5/97	
TCM	O-200	1413	5/7/97	61001-5-4
TCM	O-200	1430	5/23/97	
TCM	O-200	1437	6/17/97	255759A-48
TCM	O-200	1488	9/7/97	
TCM	O-200	1506	11/18/97	
TCM	O-200	1522	11/11/97	

TCM	O-200-A	1052	6/21/95	254150-A-48
TCM	O-200-A	1085	9/29/95	
TCM	O-200-A	1120	12/29/95	253971
TCM	O-200-A	1161	2/9/96	24R-469
TCM	O-200-A	1215	5/15/96	
TCM	O-200-A	1240	8/5/96	69589-8-A
TCM	O-200-A	1254	9/3/96	6105-71-A-R
TCM	O-200-A	1264	9/12/96	
TCM	O-200-A	1356	3/10/97	
TCM	O-300	1027	3/20/95	
TCM	O-300	1042	5/12/95	34012-D-6-D
TCM	O-300	1083	9/26/95	
TCM	O-300	1096	10/23/95	464481
TCM	O-300	1137	1/17/96	
TCM	O-300	1259	9/4/96	
TCM	O-300	1387	4/22/97	
TCM	O-300	1397	4/26/97	5928-9A
TCM	O-300	1403	4/28/97	
TCM	O-300	1423	6/9/97	3834D8Z
TCM	O-300	1555	1/13/98	
TCM	O-300-A	1446	6/27/97	
TCM	O-300-D	1022	3/17/95	35110-D-6-D
TCM	O-300-D	1079	9/17/95	24276-D-0-D
TCM	O-300-D	1487	9/6/97	
TCM	O-300-D	1543	12/3/97	
TCM	O-470	1046	6/1/95	
TCM	O-470	1383	4/4/97	
TCM	O-470-11	1017	2/22/95	

TCM	O-470-11	1491	10/19/97	
TCM	O-470-11	1492	10/19/97	
TCM	O-470-11	1493	10/19/97	
TCM	O-470-11	1494	10/19/97	
TCM	O-470-F	1236	7/25/96	76956-4-F
TCM	O-470-K	1087	10/3/95	47172-6-K
TCM	O-470-L	1128	1/10/96	68681-8-L
TCM	O-470-L	1359	5/19/97	68245-8-L
TCM	O-470-L	1399	4/28/97	
TCM	O-470-R	1016	2/10/95	133087-6-R
TCM	O-470-R	1086	10/3/95	
TCM	O-470-R	1165	2/22/96	
TCM	O-470-R	1178	3/10/96	
TCM	O-470-R	1201	6/2/96	83164-1-R
TCM	O-470-R	1319	1/6/97	459408
TCM	TSIO-520-VB	1055	6/9/95	

Note 1: Blank spaces indicate unknown data. Where the engine serial no. is blank in this table, it is either unknown or the crankshaft may not be installed in an engine.

Note 2: This airworthiness directive (AD) applies to each engine identified in the preceding applicability provision, regardless of whether it has been modified, altered, or repaired in the area subject to the requirements of this AD. For engines that have been modified, altered, or repaired so that the performance of the requirements of this AD is affected, the owner/operator must request approval for an alternative method of compliance in accordance with paragraph (c) of this AD. The request should include an assessment of the effect of the modification, alteration, or repair on the unsafe condition addressed by this AD; and, if the unsafe condition has not been eliminated, the request should include specific proposed actions to address it.

Compliance: Required as indicated, unless accomplished previously.

To prevent crankshaft failure due to cracking, which could result in an inflight engine failure and possible forced landing, accomplish the following:

(a) Within 10 hours time in service after the effective date of this AD, determine if this AD applies, as follows:

(1) Determine if any repair was conducted on the engine that required crankshaft removal during the February 1, 1995, to December 31, 1997, time frame; if the engine was not disassembled for crankshaft removal and repair in this time frame, no further action is required.

(2) If the engine and crankshaft was repaired during this time frame, determine from the maintenance records (engine log book), and Table 1 of this AD if the crankshaft was repaired by Nelson Balancing Service, Repair Station Certificate No. NB7R820J, Bedford, Massachusetts. The maintenance records should contain the Return to Service (Yellow) tag for the crankshaft that will identify the company performing the repair. Also the work order number contained in Table 1 of this AD was etched on the crankshaft propeller flange, adjacent to the closest connecting rod journal. Because some etched numbers will be difficult to see, if necessary, use a 10X magnifying glass with an appropriate light source to view the work order number. In addition, the propeller spinner, if installed, will have to be removed in order to see this.

(3) A person with a private pilot or higher rated certificate may make the determination of applicability of this AD provided the propeller spinner does not have to be removed.

(4) If it cannot be determined who repaired the crankshaft, compliance with this AD is required.

(b) Within 10 hours time in service after the effective date of this AD, accomplish the following:

(1) Perform a visual inspection as defined in paragraph (b)(2) of this AD, magnetic particle inspection, and a dimensional check of the crankshaft journals, or remove from service affected crankshafts and replace with serviceable parts.

(2) For the purpose of this AD, a visual inspection of the crankshaft is defined as the inspection of all surfaces of the crankshaft for cracks which include heat check cracking of the nitrided bearing surfaces, cracking in the main or aft fillet of the main bearing journal and crankpin journal, including checking the bearing surfaces for scoring, galling, corrosion, or pitting.

Note 3: Further guidance on all inspection and acceptance criteria is contained in applicable TCM or LYC Overhaul or Maintenance Manuals, or other FAA-approved data.

(3) Replace any crankshaft that fails the visual inspection, magnetic particle inspection, or the dimensional check with a serviceable crankshaft, unless the crankshaft can be reworked to bring it in compliance with:

(i) All the overhaul requirements of the appropriate TCM or LYC Overhaul/Maintenance Manuals; or

(ii) All of the FAA-approved requirements for any repair station which currently has approval for limits other than those in the appropriate TCM or LYC Overhaul/Maintenance Manuals.

(4) For the purpose of this AD, a serviceable crankshaft is one which meets the requirements of paragraph (b)(3)(i) or (b)(3)(ii) of this AD.

Note 4: Crankshafts removed from TCM engine models IO-360, IO-520, and TSIO-520 series engines are also subject to compliance with AD 97-26-17.

(c) An alternative method of compliance or adjustment of the

compliance time that provides an acceptable level of safety may be used if approved by the Manager, New York (LYC) or Atlanta (TCM) Aircraft Certification Offices. Operators shall submit their requests through an appropriate FAA Principal Maintenance Inspector, who may add comments and then send it to the Manager, New York or Atlanta Aircraft Certification Offices.

Note 5: Information concerning the existence of approved alternative methods of compliance with this airworthiness directive, if any, may be obtained from the Atlanta Aircraft Certification or New York Aircraft Certification Office, as applicable.

(d) Special flight permits may be issued in accordance with sections 21.197 and 21.199 of the Federal Aviation Regulations (14 CFR 21.197 and 21.199) to operate the aircraft to a location where the requirements of this AD can be accomplished.

Issued in Burlington, Massachusetts, on May 1, 1998.

Thomas A. Boudreau,
Acting Manager, Engine and Propeller Directorate,
Aircraft Certification Service.